IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re the Application

Inventor	:	Kurt, R.
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For	:	USE OF BI-LAYER PHOTOLITHOGRAPHIC RESISTS AS NEW MATERIAL FOR OPTICAL STORAGE

APPEAL BRIEF

On Appeal from Group Art Unit 1794

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, U.S. Philips Corporation, and not the party named in the above caption.

II. RELATED APPEALS AND INTERFERENCES

With regard to identifying by number and filing date all other appeals or interferences known to Appellant which will directly effect or be directly affected by or have a bearing on the Board's decision in this matter, Appellant is not aware of any such appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-7, 9-11, 13-17 and 19-23 have been presented for examination. All of these claims are pending, stand finally rejected, and form the subject matter of the present appeal. Claims 8, 12 and 18 have been withdrawn from consideration and are not considered in this appeal.

IV. STATUS OF AMENDMENTS

In response to the Final Office Action, having a mailing date of March 1, 2010, Appellant timely submitted arguments to overcome the reasons for rejecting the claims. Amendments were made to the claims. In reply, an Advisory Action, having a mailing date of May 7, 2010, was entered into the record. The Advisory Action stated that the amendments made to the claims

raised new issues that would require further consideration. The Advisory Action further stated that the amendments made to the claims in response to the Final Office Action would not be entered.

A Notice of Appeal was timely filed in response to the Advisory Action and this Appeal Brief is being timely filed, with appropriate fee, within the period of response from the date of the Notice of Appeal.

A copy of the claims, as existing in the file wrapper prior to the non-entered amendments made in the Response to the Final Office Action, is shown in the Claims Appendix, below.

V. <u>SUMMARY OF CLAIMED SUBJECT MATTER</u>

The present invention is expressed primarily in independent claims 1 (an optical storage medium), 19 (an optical storage information medium), 20 (a method), 22 (an optical information storage), and 23 (a method).

Claim 1 discloses an optical information storage medium comprising: a carrier substrate (page 12, line 17-18, Fig. 1, item 5); a reflective information layer (page 12, line 17-18, Fig. 1, item 10) being positioned on the carrier substrate and comprising at least a first layer of a first inorganic material in a first structural phase (page 12, line 17-18, Fig. 1, item 11), and at least a second layer of at least a second inorganic material (page 12, line 18-19, Fig. 1, item 12) in at least a second structural phase; and alloy inclusions (page 12, line 21, Fig. 1, item 6) being formed in the information layer (Fig. 1, item 10) upon exposure to a first electromagnetic radiation (Fig. 1, item 2) and having a structural phase

comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural wherein the optical properties of the alloy inclusions are different from the optical properties of the information layer, as-deposited (page 2, lines 29-30), so that a modulation in electromagnetic radiation reflected from the alloy inclusions and from an area comprising the as-deposited information layer, respectively, is provided in response to a second electromagnetic radiation being emitted towards the optical information storage medium to provide a read-out signal, wherein the storage medium further comprises: at least one additional layer (page 12, lines 23-24, Fig. 1, item 4) directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal (page 5, line 5), wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation (page 9, lines 5-9), and wherein said first electromagnetic radiation and said second electromagnetic radiation enter said optical information storage medium opposite to said carrier substrate (page 5, lines 12-15).

Claim 19 discloses an optical storage information medium comprising: a carrier substrate (page 12, line 17-18, Fig. 1, item 5); a first recording stack comprising a reflective information layer (page 12, line 17-18, Fig. 1, item 10) comprising at least a first layer of a first inorganic material (page 12, line 17-18, Fig. 1, item 11) in a first structural phase, and at least a second layer of at least a

second inorganic material (page 12, line 18-19, Fig. 1, item 12) in at least a second structural phase, and at least one additional layer (page 12, lines 23-24, Fig. 1, item 4) directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal (page 5, line 5), wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation (page 9, lines 5-9), alloy inclusions (page 12, line 21, Fig. 1, item 6) being formed in the information layer and having a structural phase comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural phase (page 3, lines 28-29), a separation layer, a second recording stack substantial identical to the first recording stack, and wherein a first electromagnetic radiation and said second electromagnetic radiation enter said optical information storage medium opposite to said carrier substrate (page 5, lines 12-15).

Claim 20 discloses a method for manufacturing an optical information storage medium, the method comprising the steps of: providing a carrier substrate (page 12, line 17-18, Fig. 1, item 5), providing a reflective information layer (page 12, line 17-18, Fig. 1, item 10) by depositing at least a first layer of a first inorganic material (page 12, line 17-18, Fig. 1, item 11) in a first structural phase on the carrier substrate, and depositing at least a second layer of at least a second inorganic material (page 12, line 18-19, Fig. 1, item 12) in a second

structural phase on the first layer, providing at least one additional layer (page 12, lines 23-24, Fig. 1, item 4) directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal (page 5, line 5), wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength (page 9, lines 5-9) of an electromagnetic radiation for reading said optical information storage medium, said electromagnetic radiation entering said optical information storage medium opposite to said carrier substrate, the at least first and second inorganic materials being selected so that a structural phase being formed by melting and solidification of the information layer provides alloy inclusions having a structural phase comprising a mixture of the first material in the first structural phase and the second material in the second structural phase (page 6, lines 10-13).

Claim 22 discloses an optical information storage medium provided by the method comprising: providing a carrier substrate (page 12, line 17-18, Fig. 1, item 5), providing a reflective information layer (page 12, line 17-18, Fig. 1, item 10) by depositing at least a first layer of a first inorganic material (page 12, line 17-18, Fig. 1, item 11) in a first structural phase on the carrier substrate, and depositing at least a second layer of at least a second inorganic material (page 12, line 18-19, Fig. 1, item 12) in a second structural phase on the first layer, providing at least one additional layer (page 12, lines 23-24, Fig. 1, item 4) directly adjacent the carrier substrate and positioned between the carrier

substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal (page 5, line 5), wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of an electromagnetic radiation (page 9, lines 5-9) for reading said optical information storage medium, said electromagnetic radiation entering said optical information storage medium opposite to said carrier substrate, the at least first and second inorganic materials being selected so that a structural phase being formed by melting and solidification of the information layer provides alloy inclusions having a structural phase comprising a mixture of the first material in the first structural phase and the second material in the second structural phase (page 6, lines 10-13).

Claim 23 discloses a method for optically reading an optical information storage medium comprising a carrier substrate (page 12, line 17-18, Fig. 1, item 5), a reflective information layer (page 12, line 17-18, Fig. 1, item 11, 12) being positioned on the carrier substrate and comprising at least a first layer of a first inorganic material page 12, line 17-18, Fig. 1, item 11) in a first structural phase, and at least a second layer of at least a second inorganic material (page 12, line 18-19, Fig. 1, item 12) in at least a second structural phase; and an alloy inclusions (page 12, line 21, Fig. 1, item 6) being formed in the information layer upon exposure to a first electromagnetic radiation and having a structural phase comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural phase (page 6, lines 10-

13), wherein the optical properties of the alloy inclusions are different from the optical properties of the information layer, as-deposited, so that a modulation in electromagnetic radiation reflected from the alloy inclusions and from an area comprising the as-deposited information layer, respectively, is provided in response to a second electromagnetic radiation being emitted towards the optical information storage medium to provide a read-out signal, wherein the storage medium further comprises at least one additional layer (Fig. 1, item 4) directly adjacent the carrier substrate (Fig. 1, item 5) and positioned between the carrier substrate and the at least first layer (Fig. 1, item 11), the at least one additional layer comprising at least one sub-layer being a metal (page 5, line 5), wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation (page 9, lines 5-9), the method comprising the steps of: emitting an electromagnetic radiation towards the optical information storage medium, detecting a phase or intensity modulation in electromagnetic radiation reflected from the optical information storage medium in response to the incoming electromagnetic radiation (page 8, lines 24-31), so that a pattern of alloy inclusions in the as-deposited information layer is provided by the detected phase or intensity modulation (page 8, lines 28-31).

The remaining claims, which depend from respective independent claims, express further aspects of the invention.

VI. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

The issues in the present matter are whether:

1. claims 1, 9-11, 13-14, 16-17 and 20-23 are unpatentable under 35 USC 103(a) over Aoshima (US 2003/0190551) (hereinafter referred to as D1).

2. claims 2-7 and 19 are unpatentable under 35 USC 103(a) over D1 in view of Suzuki (USP no. 6,033,752) (hereinafter referred to as D2).

VII. ARGUMENT

I. Rejection of claims 1, 9-11, 13-14, 16-17 and 20-23 under 35 USC §103

The rejection of claims 1, 9-11, 13-14, 16-17 and 20-23 as being unpatentable under 35 USC §103(a) in view of D1 is in error because D1 fails to disclose a material element recited in the claims.

Summary of the Rejection of the Claims

The Final Office Action rejected the claims referring to D1 as disclosing a recording medium comprising a substrate, a reflective layer, a dielectric layer, a two-layered recording layer, a dielectric layer and a cover layer. The reflective layer and first dielectric layer are equivalent to applicant's "additional" layers. The first dielectric layer can also be equivalent to applicant's "spacer" layer. See Figure 3 and explanation thereof. The thickness of the recording layers falls within applicant's disclosed range. Therefore, the medium would be capable of achieving the

interference effect claimed. The DVD is recorded upon with a laser which mixes the two layer of the recording layer to form recording marks. Reading is performed by detecting a difference in reflection of the recorded and unrecorded portions. See [0120].

The Final Office Action, in reply to Appellant's arguments in response to the Final Office Action, further asserts that "[a]pplicant argues that the [D1] reference does not disclose the relationship between the thickness of the recording sub-layers and the read wavelength. However, the reference does disclose the same materials in the same thickness as is discussed in the previous Office Action. As stated in the Office Action, the layers are formed of the same materials and of the same total thickness and would be capable of achieving the claimed properties. While applicant may be claiming the parameters of the medium in a different way, i.e. the total thickness of the sub-layers is dependent upon the read wavelength, the reference still meets the limitations. The total thickness of applicant's sub-layers will be a range due to the possibility of using different wavelengths. The range disclosed in the reference overlaps that claimed."

Difference between the Claimed Invention
Recited in the Independent Claims
and the Cited References

The instant invention, as recited in claim 1, for example, teaches an optical information storage medium comprising: a carrier substrate; a reflective

information layer being positioned on the carrier substrate and comprising at least a first layer of a first inorganic material in a first structural phase, and at least a second layer of at least a second inorganic material in at least a second structural phase; and alloy inclusions being formed in the information layer upon exposure to a first electromagnetic radiation and having a structural phase comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural phase, wherein the optical properties of the alloy inclusions are different from the optical properties of the information layer, as-deposited, so that a modulation in electromagnetic radiation reflected from the alloy inclusions and from an area comprising the as-deposited information layer, respectively, is provided in response to a second electromagnetic radiation being emitted towards the optical information storage medium to provide a read-out signal, wherein the storage medium further comprises: at least one additional layer directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal, wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation, and wherein said first electromagnetic radiation and said second electromagnetic radiation enter said optical information storage medium opposite to said carrier substrate (emphasis added).

D1 discloses an optical recording medium including a substrate, a protective layer, a first recording layer and a second recording layer located in the vicinity of the first recording layer. When the optical recording medium is irradiated with a laser beam, the element contained in the first recording layer and the second recording layer are mixed by the laser beam and a region whose reflection coefficient has been changed is formed, whereby information is recorded.

Contrary to the position stated in the Final Office Action and the Advisory Action, D1 fails to disclose the selection of the layer thickness based on a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer that is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation.

The Office Action asserts that because the D1 refers to a broad range of thickness that the thicknesses of the first and second layers may be selected to satisfy the claim element "wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation." That is, the Office Action infers that because D1 discloses a large range of possible thicknesses for the layers that it would be inherent that the thicknesses may be selected to satisfy the elements recited in the claims.

However, nowhere does D1 provide any teaching or suggestion of determining a distance between a reflecting surface of the as-deposited

information layer and a reflecting surface of said at least one additional layer that is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation, as is recited in the claims.

Rather, D1 discloses selecting arbitrary thicknesses of the different layers to satisfy certain manufacturing criteria regarding the layer not being too thin or too thick. For example, D1 discloses that the “thickness of the first recording layer 11 and the second recording layer 12 is not particularly limited insofar as the element contained in the first recording layer 11 as primary component and the element contained in the second recording layer 12 as a primary component …but the total thickness of the first recording layer 11 and the second recording layer 12 is preferably equal to or less than 100 nm and more preferably equal to or less than 50 nm.” (see para. 0077). Further, D1 discloses that the “total thickness of the first recording layer 11 and the second recording layer 12 is preferably equal to or larger than 2nm. Otherwise the change in reflection coefficient is too small. ” (see para. 0079).

Referring to the working examples of D1 disclosed in paras. 123-150, each of these examples refers to the parameters of working example 1 (i.e., second dielectric layer having a thickness of 60nm, a second recording layer having a thickness of 6nm, a first recording layer having a thickness of 6 nm and a first dielectric layer having a thickness of 60nm). The examples then disclose using different materials in the different layers. In para. [0151], D1 discloses the use a blue laser beam having a wavelength of 405 nm for recording information.

However, the thickness ranges taught by D1 for the first and second layers or for any additional (spacer) layer is selected based on manufacturing consideration and not based on an integer multiple of a wavelength of an electromagnetic radiation. This is further emphasized in that the thicknesses selected for the devices in each of the working examples are not selected based on wavelength of the laser beam used to read the information contained in the information layer. Nowhere is there any consideration, within the ranges described, that the thicknesses be related to a radiation wavelength.

Hence, although D1 may disclose different ranges for the elements of the optical reading medium, D1 fails to disclose that the thicknesses of the layer(s) are selected such that "a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation," as is recited in the claims.

In order to establish a *prima facie* case of obviousness, generally three basic criteria must be met;

> 1. there must be some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the reference teachings;
>
> 2. there must be a reasonable expectation of success; and
>
> 3. the prior art reference must teach or suggest all the claim limitations. The **teaching or suggestion** to make the claimed combination and the reasonable expectation of success must be found in the prior art, and not based on applicant's disclosure. *In re Vaeck* (citation omitted). (emphasis added).

In addressing obviousness determination under 35 USC §103, the Supreme Court in *KSR International v. Teleflex Inc.* (citation omitted) reaffirmed that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." (citation omitted). The Court stated that "it can be important to identify a reason that would have prompted a person ...to combine the elements in the way the claimed new invention does ... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense is already known. (citation omitted).

The Court further addressed the test that had been held as the standard for determining obviousness in decisions rendered by the CAFC in that there must be some teaching, suggestion or motivation (TSM) to combine the known elements in the same manner set forth in the claim. In this case, the Court found that the TSM to combine provides a "helpful hint" in determining whether claimed subject matter is obvious. The Court however stated that the application of the TSM test is not to be applied in a rigid manner. Rather, the Court favored a more expansive view of the sources of evidence that may be considered in determining an apparent reason to combine known elements and upheld existing precedent that "when prior art references require a selected combination to render obvious, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest

the desirability and, thus, the obviousness, of making the combination." *Uniroyal Inc. v. Rudkin-Wiley Corp*, (citation omitted).

D1 cannot render unpatentable claim 1 as D1 fails to disclose the element of selection of layers based on an integer multiple of a quarter-wavelength of a radiation and fails to provide any motivation or suggestion of determining a distance between layers based on a wavelength of a radiation source, as is recited in the claims.

For the remarks made herein, Appellant submits that the subject matter of claim 1 is patently distinguishable from that disclosed by D1 as D1 fails to disclose at least one material element recited in the claim.

With regard to the remaining independent claims, these claims recite subject matter similar to that recited in claim 1 and have been rejected citing the same reference used in rejecting claim 1. Hence, the arguments presented in response to the rejection of claim 1 are applicable to the rejection of the other independent claims, and are reasserted, as if in full, herein.

For the remarks made herein with regard to claim 1, Appellant submits that the subject matter of the independent claims is patently distinguishable from that disclosed by D1 as D1 fails to disclose at least one material element recited in the claims.

With regard to the remaining claims, these claims depend from respective ones of the independent claims. Appellant respectfully submits that these claims are allowable at least for their dependence upon an allowable base claim, without

having to discuss the merits of the rejection of the dependent claims for reasons analogous to those held in *In re Fine,* (citation omitted) (if an independent claim is non-obvious under 35 U.S.C. §103(a), then any claim depending therefrom is non-obvious).

In view of the above, applicant submits that the independent claims and the claims dependent therefrom, are patently distinguishable and allowable over the teachings of D1.

2. Rejection of claims 2-7 and 19 under 35 USC §103(a)

The rejection of claims 2-7 and 19 as being rendered obvious under 35 USC §103(a) by the combination of D1 and D2 is in error because the references, when combined, fail to show an element cited in the independent claims from which claims 2-7 depend. Independent claim 19 includes subject matter similar to that recited in claim 1 and D1 fails to disclose a material element recited in claim 19 and D2 fails to correct the deficiency found to exist in D1.

Claims 2-7 Depend From an Allowable Base Claim

Claims 2-7 depend from independent claim 1, which has been shown to include subject matter not disclosed by D1. The Final Office Action refers to D2 for teaching an optical recording medium including a substrate (2), a first recording layer (3), a second recording layer (4), a protective layer (5), and adhesive layer (6) and an upper plate (7). D2 discloses that radiation enters the optical recording medium through the substrate layer (2), which is transparent.

However, D2 fails to provide any teaching regarding setting a distance between layers based on a wavelength of a radiation source that would correct the deficiency found to exist in claim 1 and, consequently, in the aforementioned dependent claims.

Appellant respectfully submits that claims 2-7 are allowable at least for their dependence upon an allowable base claim for the reasons held in *In re Fine*, (citation omitted) (if an independent claim is non-obvious under 35 U.S.C. §103(a), then any claim depending therefrom is non-obvious).

In view of the above, Appellant submits that the above referred-to claims are patentable over the teachings of the cited references.

With regard to independent claim 19, this claim includes subject matter similar to that recited in the other independent claims and, thus, is also patently distinguishable over the combination of D1 and D2 for remarks similar to that presented herein with regard to the other independent claims.

Appellant submits that claim 19 is patently distinguishable over the cited references as the combination of the references fails to disclose a material element of the claims.

The Combination of the Cited References
Fails to Disclose all the Elements Recited in the Claims

The combination of the D1 and D2, individually or in combination, fails to disclose all the elements recited in the claims as neither reference provides for a

distance between layers that is an integer multiple of a quarter-wavelength of a radiation source, as is recited in the claims.

For at least the above remarks, Appellant respectfully submits that a case of obviousness has not been set forth with regard to all of the claims.

In view of the above, Appellant submits that the independent claims and the claims dependent therefrom are not rendered obvious over the teaching of the cited references and respectfully requests that this Honorable Board reverse the rejection of the claims.

VIII. CONCLUSION

In view of the above analysis, it is respectfully submitted that the referenced teachings, whether taken individually or in combination, fail to render obvious the subject matter of any of the present claims. Therefore, reversal of all outstanding grounds of rejection is respectfully solicited.

Respectfully submitted,
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IX. CLAIMS APPENDIX

1. An optical information storage medium comprising:

a carrier substrate;

a reflective information layer being positioned on the carrier substrate and comprising at least a first layer of a first inorganic material in a first structural phase, and at least a second layer of at least a second inorganic material in at least a second structural phase; and

alloy inclusions being formed in the information layer upon exposure to a first electromagnetic radiation and having a structural phase comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural phase,

wherein the optical properties of the alloy inclusions are different from the optical properties of the information layer, as-deposited, so that a modulation in electromagnetic radiation reflected from the alloy inclusions and from an area comprising the as-deposited information layer, respectively, is provided in response to a second electromagnetic radiation being emitted towards the optical information storage medium to provide a read-out signal, wherein the storage medium further comprises:

at least one additional layer directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal, wherein a distance between a reflecting surface of the as-deposited information

layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation,

and wherein said first electromagnetic radiation and said second electromagnetic radiation enter said optical information storage medium opposite to said carrier substrate.

2. The optical information storage medium as claimed in claim 1, wherein the inorganic materials at least comprises materials being selected from the group consisting of the pairs: As-Pb, Bi-Cd, Bi-Co, Bi-In, Bi-Pb, Bi-Sn, Bi-Zn, Cd-In, Cd-Pb, Cd-Sb, Cd-Sn, Cd-Ti, Cd-Zn, Ga-In, Ga-Mg, Ga-Sn, Ga-Zn, In-Sn, In-Zn, Mg-Pb, Mg-Sn, Mg-Ti, Pb-Pd, Pb-Pt, Pb-Sb, Sb-Sn, Sb-Ti, Se-Ti, Sn-Ti, and Sn-Zn.

3. The optical information storage medium as claimed in claim 1, wherein the inorganic materials at least comprises materials being selected from the group consisting of the pairs: Bi-Co, Bi-In, Bi-Pb, Bi-Sn, Bi-Zn, Ga-In, Ga-Sn, In-Sn, In-Zn, Mg-Sn, Sb-Sn, Sn-Ti, and Sn-Zn.

4. The optical information storage medium as claimed in claim 1, wherein the inorganic materials at least comprises the combination of Bi-In, Bi-Sn, In-Sn..

5. The optical information storage medium as claimed in claim 1, wherein each inorganic material has a complex refractive index n ± ik and wherein the second inorganic material is selected to have a real part of the refractive index lower than the real part of the refractive index of the first material and an imaginary part of the refractive index higher than the imaginary part of the refractive index of the first material.

6. The optical information storage medium as claimed in claim 1 wherein the first inorganic material forming the first layer is Bi and the second inorganic material forming the second layer is In or Sn, or wherein the first inorganic material is Sn and the second inorganic material is In.

7. The optical information storage medium as claimed in claim 1, wherein the thickness of the first and second layers are selected so that an alloy formed by melting and solidifying of at least a part of the first and second layers has a substantially eutectic composition.

8. (Cancelled).

9. The optical information storage medium as claimed in claim 1, wherein the alloy or the as-deposited information layer are substantially transparent to the second electromagnetic radiation emitted towards the medium.

10. The optical information storage medium as claimed in claim 9, wherein the at least one additional layer is adapted to reflect, absorb or diffuse the second electromagnetic radiation being emitted towards the additional layer.

11. The optical information storage medium as claimed in claim 9, wherein the at least one additional layer comprises at least one sub-layer comprising a dielectric material.

12. (Cancelled).

13. The optical information storage medium as claimed in claim 9, wherein the at least one additional layer comprises at least one transparent spacer layer.

14. The optical information storage medium as claimed in claim 1, wherein the medium further comprises a protective cover layer.

15. The optical information storage medium as claimed in claim 1, wherein the modulation in reflected electromagnetic radiation between an area comprising the alloy and an area comprising the as-deposited layer is larger than 70%.

16. The optical information storage medium as claimed in claim 1, wherein the modulation is an intensity modulation or a phase modulation.

17. The optical information storage medium as claimed in claim 1 wherein the medium is compatible with CD and DVD standards.

18. (Cancelled)

19. An optical storage information medium comprising:

a carrier substrate,

a first recording stack comprising

a reflective information layer comprising at least a first layer of a first inorganic material in a first structural phase, and at least a second layer of at least a second inorganic material in at least a second structural phase, and at least one additional layer directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal, wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation,

alloy inclusions being formed in the information layer and having a structural phase comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural phase,

a separation layer,

a second recording stack substantial identical to the first recording stack,

and wherein a first electromagnetic radiation and said second electromagnetic radiation enter said optical information storage medium opposite to said carrier substrate.

20. A method for manufacturing an optical information storage medium, the method comprising the steps of:

providing a carrier substrate,

providing a reflective information layer by depositing at least a first layer of a first inorganic material in a first structural phase on the carrier substrate, and depositing at least a second layer of at least a second inorganic material in a second structural phase on the first layer,

providing at least one additional layer directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal, wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of an electromagnetic radiation for reading said optical information storage medium, said electromagnetic radiation entering said optical information storage medium opposite to said carrier substrate,

the at least first and second inorganic materials being selected so that a structural phase being formed by melting and solidification of at least a part of the information layer provides alloy inclusions having a structural phase comprising a mixture of the first material in the first structural phase and the second material in the second structural phase.

21. The method as claimed in claim 20, further comprising the step of exposing in a predetermined pattern the information layer to a first electromagnetic radiation so as to form alloy inclusions in the exposed information layer.

22. An optical information storage medium being provided by the method comprising:

providing a carrier substrate,

providing a reflective information layer by depositing at least a first layer of a first inorganic material in a first structural phase on the carrier substrate, and depositing at least a second layer of at least a second inorganic material in a second structural phase on the first layer,

providing at least one additional layer directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal, wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of an electromagnetic radiation for

reading said optical information storage medium, said electromagnetic radiation entering said optical information storage medium opposite to said carrier substrate,

the at least first and second inorganic materials being selected so that a structural phase being formed by melting and solidification of ~~at least a part of~~ the information layer provides alloy inclusions having a structural phase comprising a mixture of the first material in the first structural phase and the second material in the second structural phase.

23. A method for optically reading an optical information storage medium comprising a carrier substrate, a reflective information layer being positioned on the carrier substrate and comprising at least a first layer of a first inorganic material in a first structural phase, and at least a second layer of at least a second inorganic material in at least a second structural phase; and an alloy inclusions being formed in the information layer upon exposure to a first electromagnetic radiation and having a structural phase comprising a mixture of the first material in the first structural phase and the at least second material in the at least second structural phase, wherein the optical properties of the alloy inclusions are different from the optical properties of the information layer, as-deposited, so that a modulation in electromagnetic radiation reflected from the alloy inclusions and from an area comprising the as-deposited information layer, respectively, is provided in response to a second electromagnetic radiation being emitted towards the optical information storage medium to provide a read-out

signal, wherein the storage medium further comprises at least one additional layer directly adjacent the carrier substrate and positioned between the carrier substrate and the at least first layer, the at least one additional layer comprising at least one sub-layer being a metal, wherein a distance between a reflecting surface of the as-deposited information layer and a reflecting surface of said at least one additional layer is adjusted to be an integer multiple of a quarter wavelength of a second electromagnetic radiation, the method comprising the steps of:

emitting an electromagnetic radiation towards the optical information storage medium,

detecting a phase or intensity modulation in electromagnetic radiation reflected from the optical information storage medium in response to the incoming electromagnetic radiation,

so that a pattern of alloy inclusions in the as-deposited information layer is provided by the detected phase or intensity modulation.

X. EVIDENCE APPENDIX

No further evidence is submitted herein.

XI. RELATED PROCEEDING APPENDIX

No related proceedings are pending and, hence, no information regarding same is available